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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/610,188	07/05/2000	Jon C. Taenzer	022577-590	5001

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San Francisco, CA 94111

EXAMINER

PENDLETON, BRIAN T

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/610,188	Applicant(s) TAENZER ET AL.	
	Examiner Brian T. Pendleton	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Response, pages 2-7, filed 9/22/05, with respect to claims 1-27 have been fully considered and are persuasive. The rejection of the claims has been withdrawn.

Applicant's arguments, see Response, pages 2-7, filed 9/22/05, with respect to the rejection(s) of claim(s) 1-27 under 35 U.S.C. 102 and 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Olson, US Patent 2,301,744.

Applicant's arguments with respect to claims 28-35 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-7, 14-16, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson. Olson discloses a microphone system in figures 1c and 4c comprising a first order microphone element 2 and combining units 3,4 for generating a second order microphone system. The first order microphone element 2 is illustrated in figures 1b and 4b. It is shown that the first order microphone element has a high pass filter frequency response in figure 3b. A correcting equalization frequency response is shown in figure 5b. The zero order

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microphone 1 (non-directional characteristic) has a flat frequency response. Olson does not disclose that the first order microphone elements have a finite delay ratio greater than one.

However, Olson suggests on page 4 that all directional patterns between a bidirectional pattern and a non-directional characteristic can be produced by a first order microphone system depending on the values of D_1 and D_2 where D_1 is the distance between the microphones and D_2 is the path length of the delay. Examiner takes Official Notice that it was well known at the time of invention to construct a first order microphone having a sound pattern with no nulls. It would have been obvious to one of ordinary skill in the art at the time of invention to design the first order microphone elements 2 to have a finite delay ratio greater than one ($D_2 > D_1$) for the purpose of generating a first order microphone element having no nulls and exhibiting a flatter frequency response than using an unidirectional characteristic as the first order microphone response.

Claims 1, 4, 5, and 14 are met. Regarding claims 6, 7, 15, 16, 22, and 23, one of ordinary skill in the art would have realized the claimed delay ratio range without undue experimentation in the pursuit of the optimal microphone system for a particular application.

Claims 2-3, 11-13, 20, 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson in view of Killion et al. Olson does not disclose that the microphone system is used on a human head. Nevertheless, it was well known to use directional microphone systems on the human head, as hearing aids, for example, as evidenced by Killion et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the apparatus of Olson in a hearing aid apparatus for the purpose of improving the listening capabilities and noise reduction for the user. Claims 2, 3, 11-13, 20, 21, and 27 are met.

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Claims 8, 17, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson in view of Sessler et al, US Patent 4,742,548. Olson discloses a combination circuit but does not explicitly disclose delay and subtraction units. Sessler et al disclose a second order microphone system in figure 12 comprising first order microphone elements 14, 24, delay elements 30, 35 and subtraction unit 42. Hence, it was well known to use delay and subtraction to create a directional sound pattern. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the apparatus of Olson with delay and subtraction elements, as taught by Sessler, for the purpose of generating a directional gradient sound pattern.

Claims 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson in view of Sessler as applied to claim 8 above, and further in view of Thompson. The combination of Olson and Sessler does not disclose a matching function. Thompson discloses an apparatus and method for matching the response of microphones. It was suggested to match the response of microphones in directional microphones to improve directional processing. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to use a matching function in the combination of Olson and Sessler for the purpose of producing an accurate directional response in the second order microphone system. Claim 9 is met. As to claim 10, Examiner takes Official Notice that it was obvious to use a processor to combine microphone signals at the time of invention.

Claims 18, 19, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olson in view of Thompson. Olson does not disclose a matching function. Thompson discloses an apparatus and method for matching the response of microphones. It was suggested to match

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the response of microphones in directional microphones to improve directional processing.

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to use a matching function in Olson for the purpose of producing an accurate directional response in the second order microphone system. Claims 18 and 25 are met. As to claims 20 and 26, Examiner takes Official Notice that it was obvious to use a processor to combine microphone signals at the time of invention.

Claims 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartlett et al in view of Arndt, US Patent 6,954,535. Bartlett discloses a microphone system with two microphone elements, a test sound and using the output of the two microphone elements to match the signals from them. Bartlett does not disclose that the test sound comes from the back direction. Arndt discloses an apparatus for testing a hearing aid 1 with two microphone elements 2, 3. As shown in figure 1, the test sound comes from behind the hearing aid 1 with loudspeaker 13. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to supply test sound from the back in the apparatus of Bartlett for the purpose of matching the microphone signals with precise measurement. As to claims 30 and 31, Bartlett et al do not disclose that the microphone elements are first-order microphone elements having a delay ratio in the range of 1.5 to 3 or null-less. However, it was well known to match the elements of any microphone array system having a plurality of microphones in order to improve the response to incoming sounds. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the Bartlett apparatus for a system with null-less first order microphone elements. Per claim 35, there is no patentable difference between testing microphone elements together or individually.

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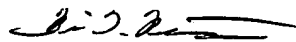
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (571) 272-7527. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian T. Pendleton
Primary Examiner
Art Unit 2644



btp